

CLAIMS

1. A method for surface treatment comprising the steps of :
cleaning a surface of an object to be processed by using ClF_3
5 gas; and
removing chlorine derived from the ClF_3 gas still remaining on
the surface of the object under treatment even after the step of
cleaning the surface.
- 10 2. A method for surface treatment according to claim 1 wherein
the step of removing chlorine includes a step of removing chlorine from
the surface of the object to be processed by using a reducing gas.
- 15 3. A method for surface treatment according to claim 2 wherein
the reducing gas is H_2 gas.
4. A method for surface treatment comprising the steps of:
making ClF_3 gas adhere to a surface of an object to be
processed
20 by supplying the ClF_3 gas to the surface of the object to be processed;
interrupting the supply of the ClF_3 gas to the surface of the
object to be processed; and
cleaning the surface of the object to be processed by using the
 ClF_3 gas adhering to the surface of the object to be processed.
- 25 5. A method for surface treatment according to claim 4 wherein
the object to be processed is cooled to 20°C or below in the step of
making
 ClF_3 gas adhere to the surface of the object.
- 30 6. An apparatus for surface treatment comprising:
a processing vessel in which a object to be processed is placed;
a means for supplying ClF_3 gas into the processing vessel;
a means for activating the ClF_3 gas supplied in the processing
35 vessel; and
a means for supplying a reducing gas into the processing
vessel.

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7. An apparatus for surface treatment comprising:
a processing vessel in which a object to be processed is placed;
a means for supplying ClF_3 gas into the processing vessel;
5 a means for promoting adhesion of ClF_3 gas to the object to be
processed; and
a means for activating ClF_3 gas supplied in the processing
vessel.
- 10 8. An apparatus for surface treatment according to claim 7 further
comprising a mount located in the processing vessel to set the object to
be processed thereon.
- 15 9. An apparatus for surface treatment according to claim 8
wherein the means for promoting adhesion of the ClF_3 gas to the object
to be processed is provided in the mount to function to cool the object
to be processed on the mount.
- 20 10. An apparatus for surface treatment according to claim 9
wherein the means for activating the ClF_3 gas heats the object to be
processed in a heating position distant from the object setting position
for setting the object on the mount.
- 25 11. An apparatus for surface treatment according to claim 10
further comprising a means for elevating and lowering the object to be
processed between the object setting position and the heating position.
- 30 12. A cluster device comprising:
the apparatus for surface treatment according to any one of
claims 6 through 11;
a transport chamber capable of maintaining a non-reactive
atmosphere inside and capable of transporting a object to be processed
in the non-reactive atmosphere to and from the surface processing
apparatus; and
35 one or more processing apparatuses capable of transporting the
object to be processed to and from the transport chamber.

13. ~~The cluster device according to claim 12 wherein the apparatus for surface treatment is a metal wiring formation chambers for making metal wiring on the object to be processed.~~

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